**Forthcoming in *Nature Climate Change –* accepted for publication 11 May 2015**

**MS # NCLIM-14101518C**

**Perspectives article –**

**Emergence of polycentric climate governance and its future prospects**

**Andrew J. Jordan,1 Dave Huitema,2 Mikael Hildén,3 Harro van Asselt,4 Tim J. Rayner,5 Jonas J. Schoenefeld,6 Jale Tosun,7 Johanna Forster8 and Elin L. Boasson9**

**1 Tyndall Centre for Climate Change Research, UEA, Norwich, NR47TJ, UK; 00 44 1603 592552;** [**a.jordan@uea.ac.uk**](mailto:a.jordan@uea.ac.uk) **[corresponding author]**

**2 IVM, VU University Amsterdam & Faculty of Management, Science and Technology, Netherlands Open University; 00 31 20 59 89559;** [**dave.huitema@vu.nl**](mailto:dave.huitema@vu.nl)

**3 Finnish Environment Institute, SYKE, Helsinki, Finland; 00 358 29525173;** [**mikael.hilden@ymparisto.fi**](mailto:mikael.hilden@ymparisto.fi)

**4 Stockholm Environment Institute, Oxford; 00 44 186 542 6316;** [**harro.vanasselt@sei-international.org**](mailto:harro.vanasselt@sei-international.org)

**5 Tyndall Centre for Climate Change Research, UEA, Norwich, NR47TJ, UK; 00 44 1603 593905;** [**t.rayner@uea.ac.uk**](mailto:t.rayner@uea.ac.uk)

**6 Tyndall Centre for Climate Change Research, UEA, Norwich, NR47TJ, UK; 00 44 1603 591378** [**J.Schoenefeld@uea.ac.uk**](mailto:J.Schoenefeld@uea.ac.uk)

**7 Institute of Political Science, Heidelberg University, Germany;** [**jale.tosun@ipw.uni-heidelberg.de**](mailto:jale.tosun@ipw.uni-heidelberg.de)

**8 Tyndall Centre for Climate Change Research, UEA, Norwich, NR47TJ, UK; 00 44 1603 591374;** [**j.forster@uea.ac.uk**](mailto:j.forster@uea.ac.uk)

**9 CICERO, Blindern, Oslo, Norway; 00 47 22841710;** [**elin@cicero.oslo.no**](mailto:elin@cicero.oslo.no)

**Abstract**

*Governance responses from the international climate regime have been widely critiqued. But fresh research is revealing that ‘new’ and more dynamic forms of governing are appearing in alternative domains, producing a more polycentric pattern. Some analysts believe that these ‘new’ forms will fill gaps in the regime, but this optimism is based on untested assumptions about their diffusion and performance. We conclude that the advent of more polycentric governance does offer new opportunities to govern climate change, but based on existing empirical research it is far too early to judge whether hopes about the performance of the ‘new’ forms are well founded. More time and vastly more coordinated research efforts are needed to comprehend their full potential; time that is in very short supply in governing climate change.*

It is a truism that humanity is struggling to govern climate change. In spite of all the resources invested in the regime centred on the UN Framework Convention on Climate Change (UNFCCC), emissions continue to rise, dramatically reducing the probability of remaining within two degrees.1 Achieving the emission reductions that are factored into many low concentration pathways arguably requires new and much more “integrated and aggressive”2 forms of governance (that is, modes and mechanisms to steer society)3. But where will these new forms originate, how will they diffuse, and what factors will shape their ability to perform as hoped?

Most analysts used to assume that the innovative thrust in governance would spring from a comprehensive global climate regime.4 However, even before the failure of the 2009 Copenhagen conference, some international relations scholars had moved on from the idea of a single, monocentric regime to consider multiple, interlocking ‘regime complexes’ such as those focusing on trade, energy and climate.5-9 What is striking about this strand of work is that while it hints at the potential of more pluralistic forms of governing,9 its scale is still international and its underlying ontology remains essentially top-down and state-centric.

While this is clearly an important and flourishing perspective, there is a growing belief that it is only a partial one, and that the landscape of climate governance has extended beneath the international level10 through changes initiated by numerous actors from different backgrounds, such as business, local government and civil society. Armed with less top-down, more governance-centred analytical frameworks, social scientists have started to chart the changing landscape of climate governance, now increasingly populated by novel forms including emissions trading systems,11 offsetting standards, emissions registries, carbon labelling schemes and collaborations between cities.4, 12 Interestingly, these efforts have spilled back into the UNFCCC negotiations to some degree, with discussions on climate action pre-2020 engaging with non-state actors more deeply (e.g. through so-called Technical Expert Meetings and the UNFCCC Secretariat’s web portal of non-state climate action).13

The argument that in order to become more effective, climate governance *in toto* should become more diverse and multi-levelled is not new.14-16 Economists have long debated the theoretical merits of linking national and/or regional emission trading systems.17 Political theorists have also emphasised the advantages of governing from the ‘bottom up’ – more scope for experimenting, a better fit with local priorities, etc. – for considerably longer.18 What has changed is that fresh empirical efforts are now revealing that the emergence of ‘new’ forms of governing has a solid basis in empirical reality, and the overall landscape of climate governance has started to exhibit some of the characteristics of polycentricity foreseen by Elinor Ostrom, that is more diverse, multi-levelled and with a much greater emphasis on bottom-up initiatives.19

A vibrant and energetic debate is underway concerning the merits of these apparently ‘new’ forms of governing, only some of it reported in the Intergovernmental Panel on Climate Change’s (IPCC) Fifth Assessment Report. In stark contrast to discussions centred on the UNFCCC, this debate is exciting precisely because it appears to offer empirical validation for a broader narrative of dynamism in a world disillusioned with the UNFCCC process.4, 20 However, we believe that the challenge confronting scholars of the ‘new’ governance is to ensure that this positive narrative remains empirically informed and attentive to the tendency for over-enthusiasm to creep into studies of innovative activity.21

In this article we directly address the challenge of ensuring that expectations remain informed by evidence by critically reflecting on the opportunities created by, and the limitations inherent in, the ‘new’ forms of governing. We draw upon insights from two even more recent strands of research, broadly covering the national (including sub-national) and the transnational domains, and relate them to the findings emerging from the first (and much older) strand of work on international / global governance noted above. We argue that much deeper connections between them are needed to understand better the opportunities and pitfalls of both the ‘new’ and the older climate governance. To that end, we reveal that existing work on the ‘new’ governance has uncovered many new and important insights, but is yet to comprehend the complex interconnections between the transnational, national and international domains.

In seeking to encourage a more holistic and reflexive understanding of climate governance, we examine how far the three strands address three important, cross-cutting topics, relating to:

* *Distribution*: what forms of governing are emerging, when and in which sectors and/or countries? How ‘new’ are they?
* *Origins, invention and initiation*: why are the ‘new’ forms of governing emerging and through which mechanisms are they diffusing and/or scaling up?
* *Performance*: what do they actually add up to, for example in terms of emissions reduced?22 More broadly, are they filling “gaps” in the regime23 or reproducing what is already there?

We reveal that work on the ‘new’ climate governance is addressing the first of these topics, but should do more to tackle the other two. We find that the three strands (international, transnational, national) are broadly complementary in their approach, but much deeper collaboration, organised around shared terms and concepts, is required to produce a more holistic picture. In the final section we explore the most important policy-relevant research gaps that emerge from our analysis.

**Strands of work**

One of the most dynamic strands of research activity concerns transnational forms of governance.24 For Abbott,25 these span national borders, dissolve the traditional analytical divide between public and private spheres and are decentralised. Analysis of a number of databases4, 24-26 reveals that these transnational initiatives are numerous and highly diverse in form (ranging from setting rules to sharing information) and scale (from global down to city level). Most are relatively new (post-2005) and are mainly mitigation-focused.24 Most have been initiated by actors in industrialised countries, albeit with the active participation of actors from the Global South.24, 27 For example, seven countries (Bangladesh, Canada, Ghana, Mexico, Sweden, and the United States) and the UN Environment Programme launched the Climate and Clean Air Coalition in 2012 in order to promote action on short-lived climate pollutants by state and non-state actors. Projects are being implemented to reduce levels of black carbon, methane, and hydrofluorocarbons (HFCs) across a membership (in 2013) that has expanded to 43 states and 53 non-state partners.28, 29

Another, equally dynamic strand of research focuses on the public policy-making activities of nation states, including local governments. Until recently, the literature on national policy offered only broad overviews of whole countries and/or non-cumulative case studies of specific polices and instruments. But attempts are now being made to assemble a fuller and more detailed picture, also based on large databases. These reveal much greater dynamism than many originally assumed. For example, Green Globe’s database reveals that there were 487 climate change-related laws and policies in 66 countries in 2013, up from only 40 in 1997.30 Around 30 new policies are being adopted each year, with non-Annex 1 countries being especially active. Similar findings have been uncovered in a comparable database produced by Dubash *et al*.31, which confirms that adoptions are occurring faster in non-Annex 1 countries and indicates that the share of world population covered by national policy doubled between 2007 and 2012. Moreover, states are not only actively innovating in relation to mitigation; the number of new national adaptation strategies has also grown spectacularly in the last decade.32

The rediscovery of the state as a dynamic site and catalyst of governing is a little unexpected, especially for those who identify states as a primary cause of governance failure.33 These findings tie with Green’s suggestion34 that global climate governance is a positive-sum game where governance efforts by state and non-state actors grow simultaneously and in a mutually reinforcing manner. Together, these findings emphasise the need to work across both strands of the ‘new’ climate governance literature.

**Distribution**

These two strands of research suggest that there is a ‘new’ climate governance emerging (that is, dating mostly from the mid- 2000s), although we certainly do not wish to over-stress its novelty (some national policies pre-date the UNFCCC).35-39 In fact, we firmly believe that now is the right time to debate the most appropriate analytical categories to measure the distribution of the ‘new’ climate governance.

At national level, attempts to open up the analytical category of ‘policy’ – which tends to be ‘black boxed’ by those who focus on international processes – reveal that it can be characterised in multiple ways: some policies are legally binding whereas others are not; some are adopted by national policy makers, others by sub-national actors such as local governments and city mayors; some are explicitly labelled as climate policy whereas others are primarily seen as relating to older policy areas (finance, transport, housing or forestry).40, 41

Although these distinctions may appear subtle, the multi-dimensionality of policy is important, perhaps revealing underlying political motives. Dubash *et al.*31 for example have found that non-binding strategies are being adopted at a much faster rate than legally binding policies. Variation is also evident in the sense that countries with very similar emission reduction targets routinely employ different mixes of implementing instruments that are harnessed by these policies.42 Variations in policy type may also reveal politicians’ expectations about implementation and, eventually, performance.43 Although the existing distribution and internal characteristics of policy have probably not had a very significant effect on net emissions (relative to non-policy effects – see below), they may nevertheless open up new political opportunities to collaborate, such as by linking similar instruments (like emissions trading) in different countries.

Two important challenges remain for those working on national policies. First, scholars must find better ways to define and track policy adoptions and innovations; an under-appreciated challenge when policy-making activity is constant and no single actor is responsible for collecting comparable data. As the international regime shifts to a more bottom-up architecture, with each party pledging and reviewing its own policy commitments (in UNFCCC speak: ‘intended nationally determined contributions’), we expect this hitherto largely academic task to become considerably more policy-relevant. Second, having collected comparable data, explanations for what is causing observed differences can be sought - a precondition for altering, through purposive steering, the future orientation of governance. Again, experience suggests that explanations will take time to derive. Decades of comparative policy analysis suggest that cross-national variations are likely to arise from a complicated nexus of factors that are internal and/or external to particular countries.42

Those working on transnational governance have also begun to reflect upon the distribution of non-state initiatives. As territorial categories are assumed to be less relevant, other categorisations have been invented. Abbott,25 for example, reveals that transnational initiatives perform myriad functions including some (such as rulemaking and implementation) usually considered the preserve of states. Two, however, stand out: capacity building and information sharing12 – governing functions where the state’s comparative advantage is relatively low, especially at a restricted spatial scale. This finding suggests that actors may be self-organising around a mutually beneficial division of labour, as envisaged in Ostrom’s reading of polycentricity.19, 44-46

Finally, much like the databases of policy activity, most (but not all47) studies of transnational governance offer rather static snapshots, which struggle to account for dynamic processes of evolution, diffusion and performance. For example, how do they spread across borders and in which countries are they most active? What factors help to bring about the mutual learning from these processes of experimentation, without which the oft-claimed advantages of polycentrism48 might not emerge? And who remains actively involved once a scheme is up and running, for how long and why?

**Origins**

The two new strands of literature would seem to bear out the general claim that climate governance has become more polycentric.49, 50 *Why* it has become so is much less clear, not least because both strands offer partial perspectives. This constitutes a significant research gap. In environmental social science, two broad categories of motivation to engage in multi-actor governance are normally cited: financial and non-financial.51 How well do these carry across to the ‘new’ climate governance? As regards transnational governance, most scholars are still identifying potential sub-categories of motivation, including moral concerns, fear of new regulation (or the opportunity to secure first-mover advantages by shaping it), the pursuit of direct financial rewards, indirect or ‘non-climate’ benefits (e.g. reputational enhancement), and the satisfaction of consumer expectations.4, 24, 25, 34

Studies of the emergence of new national policies have also hypothesised – but not yet fully tested for – similar meta-motivations. Dubash *et al*.31, for example, mention the need to comply with UNFCCC requirements, the desire to reap competitive advantages and/or indirectly empower pro-environmental political actors (see also52). Studies of specific policy innovations have tried to disentangle these motivations using large ‘n’ statistical techniques.53, 54 We have already noted how such studies tend to gloss over the subtle but important differences between and within individual policies; analysts are also becoming more aware of their insensitivity to slow processes of refinement as policies diffuse and take root in particular jurisdictions.55 Case study analyses have shown that instrument constituencies drive these processes, motivated by a desire to diffuse a particular policy instrument (such as emissions trading),11 often in collaboration with policy entrepreneurs.56, 57

Centre stage in these policy adoption processes are (sub)national politicians – a distinct actor category all too often ignored by transnational and international scholars. One of the enduring puzzles in public policy analysis is what motivates them to address climate change: to claim credit by adopting successful and innovative policies, to avoid blame for things that go wrong, or to generate a long-term policy legacy?58 Howlett59 argues that when it comes to a long-term problems like climate change, where the causal chains connecting specific policy interventions and impacts are convoluted, politicians will normally opt to do nothing (or at the most, very little) rather than something bold (such as adopt a binding medium-term emissions target) for which they might eventually be blamed by powerful interest groups and/or voters.

But if this blame-avoidance motivation is really as common as Howlett suggests, what is driving the new policy activity noted above? Are politicians engaging in complex forms of political risk management, for example by emulating and learning from what other countries are doing60 – a form of diffusion which might in turn enable greater polycentrism? Or are they, as Dubash *et al*. seem to indicate,31 engaging in a more negative form of policy innovation, which is symbolic and/or simply intended to capture funding from abroad?59 Whilst suggestive of explanations, the databases do not dig deeply enough into specific cases to reveal which holds true.

Interestingly, the proximate trigger to *initiate* many new transnational schemes also derives from state action, chiefly from local governments.24 In their database, Hale and Roger26 estimate that approximately a third were originally initiated – or ‘orchestrated’ - by state bodies and/or international organisations (e.g. the World Bank) established by states. This finding hints at two intriguing possibilities. One is that national politicians may be making much more complex political choices about credit and blame across different many *types* of governance (i.e. national policy vs. transnational etc.). Another is that the politicians that do wish to act may be engaging in subtly different (that is, domain-specific) forms of state steering to deliver functional polycentric governance. If true, these interventions would seem to go well *beyond* the baseline tasks commonly identified in polycentric theory, such as guaranteeing due process, collecting data and helping to scale up successful innovations.61, 62

**Performance**

As faith in a multilateral approach declines and governance becomes more polycentric, some theorists have suggested that gaps in the former may, under certain favourable circumstances, be plugged by the latter.48 But before we raise our hopes, we should better understand how the new forms of governing are actually (not) performing.63, 64 This vital evaluation task is proving to be technically complex65, 66 and politically sensitive67, 68, so much so that even for the UNFCCC, now more than 20 years in the making, it is difficult to make definitive statements about performance.

At present, much climate policy evaluation relies upon states self-reporting their activities and achievements to the UNFCCC. This work is driven by the immediate political pressure to fulfil international commitments, hence the heavy emphasis on very broad compliance exercises.67, 69 These exercises have in turn informed academic studies which have sought to construct indices showing the countries (but typically not the specific national *policies*) that have generated the greatest net emission reductions.42 Other researchers are now building on this work to go beyond broad correlates of performance to examine the interaction between the effects of state characteristics (income levels, democratic institutions etc.) and international factors (international agreements, policy diffusion etc.) - a complex task which requires panel data covering many countries and long time periods.70

When it comes to evaluating the performance of *individual* policies, and thus actively supporting governance innovation through polycentric experimentation, there is very little comparable data,42, 63, 71-73 although a recent systematic review74 finds that those policies that perform the best are well-timed, embody progressively ambitious targets, and offer flexibility to target groups.

Eventually, a political cost may have to be paid for not investing in stronger performance assessment capacities. Recall that both Ostrom19, 49 and the IPCC75 underscore the political importance of revealing the potential co-benefits of acting (e.g. health or economic competitiveness) as a means to overcome public acceptability concerns. However, since accurate and timely *ex post* policy evaluations of such benefits are often lacking,66, 76 politicians do not necessarily have the evidence of co-benefits to hand to muster a strong political case for policy innovation. There is a paradox at work here, because one of the reasons for this knowledge gap is that governors (including politicians) are often unwilling to invest in long-term *ex post* evaluation capacities,77 in case they reveal *inter alia* embarrassing levels of under-performance.78

In the transnational governance domain, even less is known about performance.24, 79 Unlike national policy, where some forms of evaluation are at least routinely undertaken, no single actor has yet felt compelled to lead. More fundamentally, scholars disagree on how even to approach the topic. Beisheim and Campe80 argue that in principle there are several analytical entry points, with the difficulty of measurement significantly increasing as one moves along the impact chain from policy and governance outputs, to outcomes and impacts. For national policy, ‘tonnes of emissions reduced’ is a common outcome measure. But amongst governance scholars, who tend to focus on “soft results”51 such as learning, trust and legitimacy, there is concern that emissions – and thus outcomes - may be entirely the wrong place to start,24 given the very mixed motives for adopting policies in the first place. Green, for example, suggests that analysts should focus on the outputs of transnational governance, and assess these over time, on the basis that the objectives and activities of such arrangements are often not directly intended to trigger emission reductions, but rather offer indirect (or ‘process’) contributions (e.g. sharing knowledge, enhancing awareness etc.).34 Yet without a source of comparable and transparent information on outcomes it will be very difficult to verify the (big) claim that the effects of polycentric governance are “slowly cumulating and can be expected to increase their contributions over time”.19

As the fascinating debate about performance advances, some fairly simple proxy measures could be tested. For example, as a first order, output-based measure of performance, we might explore whether the ‘new’ forms of governance incorporate rigorous monitoring and evaluation procedures. The two strands of literature suggest that both national and, in particular, transnational governance, tend not to.24, 78 Second, at an even more basic level, do the forms endure long enough to perform? While many bottom-up environmental initiatives emerge, experience suggests that many quickly and quietly “sink”81, particularly when states withdraw support. Many of the public-private partnerships adopted at the Johannesburg World Summit on Sustainable Development in 2002 have suffered this fate.82 New work on the lives83 of national policies, which could be extended to the transnational domain, is shedding light on their perilous existence.84 Biesenbender and Tosun85 have revealed that national interest groups dominate post-adoption processes by exerting *downward* pressure on policy standards. States tend to respond to pressure from domestic interest groups by quietly pulling back from an international norm, rather than openly withdrawing from it.

Although much more work on performance is required, three important things are already known. First, the ‘new’ forms of governance evidently have weaknesses and hence are not without risk. By the same token, although there remain huge gaps in understanding precisely what works, polycentric governance is unlikely to be a panacea.86 Second, performance evaluation appears not to self-organise as easily from the bottom up as Ostrom claimed it would.87 Indeed, one of the largest meta-analyses of climate policy evaluations77 suggests that non-state actors, such as academics and consultants, are unwilling and/or unable to fill in the resulting gaps in the baseline evaluation that polycentric theory assumes states will deliver. Their reluctance is especially marked in relation to the more reflexive types of evaluation that challenge extant policy goals.88 Third, the three domains of governing are much more interdependent than was originally foreseen. Moreover, if Biesenbender and Tosun’s argument about states preferring to quietly pull back from international norms is correct,85 national politicians looking for a window of opportunity to engage in national policy innovation could be condemned to wait for the next cycle of international negotiation to (slowly) reach agreement.

**Moving forwards**

We have shown that each governance domain has attracted its own strand of scholarship. Much research effort has – rightly in our view – been invested by each strand into mapping the expanding universe of cases within each. This activity has confirmed that much of the activity within the transnational and (sub)national domains is ‘new’, in that it dates from the mid-2000s. This inspires hope that climate governance *in toto* is more active than critics transfixed by UNFCCC-related meetings have assumed. It has also added empirical flesh to Ostrom’s claim that climate governance has become considerably more polycentric49; a phenomenon that scholars working in the separate streams were struggling to account for using their own internal analytical categories. New scholarship has shown that the advent of ‘new’ forms of climate governance has made the overall landscape more polycentric, spanning many spatial levels (international, national, etc.) and working through many modes (markets, networks and hierarchies) and domains of action (public policy, transnational governance). This pattern bears out many, but not all, of Ostrom’s predictions.

As new research in the separate strands emerges, two analytical challenges cry out for greater attention. The first is to build bridges between the strands in order to better understand the interaction between the three governance domains. For example, that many of the transnational initiatives have emerged in the shadow of state action bears out earlier predictions that transnational and state-led governance are likely to be tightly interconnected.89 Similarly, data on national policy activity (itself collected via transnational action - such as Green Globe and Climate Action Tracker) has allowed academics to reveal the timing and extent of national policy activity. However, at present, academics have barely typologised the many possible forms of interaction between the domains, let alone traced them out empirically or explained their causes. In principle, at least four types of interaction between actions across the domains are possible: they could complement one another without actually interacting; they could merge; they could compete and conflict with one another; or some could actively replace other types.23 These forms of interaction - termed co-existence, fusion, competition, and replacement respectively43 – could form the basis of a common programme of research. Ostrom19 was generally optimistic, believing that the net result of the interactions would be synergistic and hence “cumulatively additive”, but we believe that the jury is still out on this matter.

The axis of interaction running between international governance, exemplified by the UNFCCC, and the other two domains, appears especially influential. There is plenty of case-specific evidence (and much speculation) that international processes (be they active in the form of new commitments, or vice versa) matter immensely for other governance domains. For example, Moncel and van Asselt52 have claimed that the UNFCCC has indirectly catalysed action in other domains. But how, why and when these side effects matter remains a matter for conjecture. For example, are the countries that are seeking to push the UNFCCC process also the most active adopters of national policy and/or incubators of transnational governance? Does the perception that a particular state is pulling back from international cooperation nudge domestic actors into governing through other domains, as appears to be the case in some US states?25 Process tracing work on the timing and sequence of these interactions would indicate where the main impulses arise.90 Either way, exploring the interactions empirically – perhaps even statistically – will offer a more informed basis on which to understand climate governance91 than dichotomous modes of thinking which assume that monocentric governance is broken and transformative governance must be polycentric.92

A second challenge is to understand better the role(s) played by states in the three domains. It is somewhat surprising that this question should have arisen so quickly, given that previous work has assumed that governance is usually enacted “without government”.93 The strand of work on transnational governance has tended not to explore state roles that deeply, having implicitly embraced a ‘small state’ framing of governance. But more detailed work is now shedding light on the multiple, sometimes overlapping roles that state politicians and bureaucrats play. For example, through ‘new’ climate governance work we are now appreciating that so-called ‘leader’ states that engage in policy innovation, also work through international organisations (such as the World Bank) and supranational bodies (such as the EU) to ‘orchestrate’ new forms of transnational governance.94

Scholars accept that even polycentric orders need some ’legal framework’.61, 62 But some states are offering a good deal more. They are actively nurturing national policy inventions by: working with policy instrument constituencies (emissions trading and feed-in tariffs55 being prominent examples); facilitating their diffusion by creating learning capacities in organisations such as the OECD, the World Bank and the European Commission; and encouraging learning by establishing bodies with a capacity to evaluate such as the European Environment Agency.67 While these may appear to be subtle activities, we surmise that they are likely to be politically demanding,68 and certainly no less tricky than crafting international regimes. Understanding the choices lying behind them will require a much better understanding of the behaviour of politicians and senior bureaucrats. Fresh work is needed on which factors – electoral, economic, ideological or legal – tip the balance from claiming credit, to avoiding blame, to producing legacy effects. Subsequently, what determines their willingness to lead (or to stymie) efforts to govern transnationally, as compared to national or international action? We believe that searching for more conditional explanations for state (in)action across a wider variety of contexts, including emerging democracies,95 is a more productive way to understand the promise and limits of polycentric governing, than assuming that initiatives will come either from the top or the bottom.

A fuller and firmer appreciation of the inherent messiness of the interactions between the three domains will greatly enhance our collective understanding of the ‘new’ governance; knowledge which, if translated into governance design activities, could inform the Paris conference in 2015. For researchers, it implies a need to build stronger bridges between the research strands, and work on mitigation and adaptation (the latter being especially under-represented in our stock take). Bridge building is not a trivial task – concepts developed in the national policy literature will need careful translation into the transnational realm, and vice versa. But by illustrating how each strand speaks to the shared analytical puzzles of distribution, initiation and performance, we have shown that although all three are guilty of concept stretching,96 they are nonetheless essentially complementary – an encouraging foundation for future collaboration. Indeed, the welcome shift from single cases to more comprehensive databases suggests that convergence is eminently possible in the short term. Further breakthroughs will, we believe, be made when larger ‘n’ quantitative studies are connected to qualitative analyses of individual cases.97 Hale and Roger’s26 insightful analysis of the most dynamic orchestrators of transnational governance offers a very good example of what can be learnt by creatively mixing methods.

For practitioners, messiness in governance implies that some of the initially high hopes that bottom-up forms of governing would magically spring up and save the day, should be tempered. Unfortunately, given the acute urgency of moving the world onto a path of radical decarbonisation, it could be some time before the precise circumstances in which the new forms of governance are emerging and performing are sufficiently understood. Political efforts to catalogue and evaluate the ‘new’ climate governance should be strengthened, building on existing activities both within (e.g. the Non-State Actors Zone for Climate Action13) and outside the UNFCCC. In the meantime, and knowing what social scientists are beginning to discover about the dense and messy interconnections between the three domains, it would, as Ostrom reminded us just before her untimely death, be extremely unfortunate if there was any let-up in the diplomatic efforts to craft an ambitious international agreement in Paris.

**Correspondence**

Correspondence and requests for material should be sent to Andy Jordan: [a.jordan@uea.ac.uk](mailto:a.jordan@uea.ac.uk)

**Acknowledgements**

Very helpful comments on earlier drafts were received from Robbert Biesbroek and four anonymous referees. The writing of this article was facilitated by funding from the COST network INOGOV – Innovations in Climate Governance (IS1309): [www.inogov.eu](http://www.inogov.eu).

**Statement of contributions**

AJ and DH conceived and designed the paper, contributed materials and wrote it. MH, HvA, TR, JS, JT, JF and EB contributed materials and wrote the paper.

**References**

1. Jordan, A. *et al*. Going beyond two degrees? The risks and opportunities of alternative options. *Climate Policy* **13**, 751-769 (2013).

2. Davis, S. J., Cao, L., Caldeira, K. & Hoffert, M. I. Rethinking wedges. *Environmental Research Letters* **8**, 011001 (2013).

3. Levi-Faur, D. in *Oxford Handbook of Governance* (Oxford University Press, Oxford, 2012).

4. Hoffmann, M. J. in *Climate governance at the crossroads: experimenting with a global response after Kyoto* (Oxford University Press, 2011).

5. Keohane, R. O. & Victor, D. G. The regime complex for climate change. *Perspectives on politics* **9**, 7-23 (2011).

6. Falkner, R., Stephan, H. & Vogler, J. International climate policy after Copenhagen: Towards a ‘building blocks’ approach. *Global Policy* **1**, 252-262 (2010).

7. Biermann, F. *et al*. Earth system governance: A research framework. *International Environmental Agreements: Politics, Law and Economics* **10**, 277-298 (2010).

8. Biermann, F. in *Earth system governance: world politics in the anthropocene* (MIT Press, Cambridge (MA); London, 2014).

9. Aldy, J. E. & Stavins, R. N. in *Post-Kyoto International Climate Policy: Implementing Architectures for Agreement* (Cambridge University Press, Cambridge, 2009).

10. World Bank. World Development Report 2010: Development and Climate Change. (2010).

11. Voß, J. & Simons, A. Instrument constituencies and the supply side of policy innovation: the social life of emissions trading. *Environmental Politics* **23**, 735-754 (2014).

12. Bulkeley, H. *et al*. Governing climate change transnationally: assessing the evidence from a database of sixty initiatives. *Environment and Planning C: Government and Policy* **30**, 591-612 (2012).

13. http://climateaction.unfccc.int/.

14. Rayner, S. How to eat an elephant: a bottom-up approach to climate policy. *Climate Policy* **10**, 615-621 (2010).

15. Stewart, R. B., Oppenheimer, M. & Rudyk, B. A new strategy for global climate protection. *Clim. Change* **120**, 1-12 (2013).

16. Rayner, S. & Caine, M. in *The Hartwell Approach to Climate Policy* (Routledge, Oxon, 2014).

17. Green, J. F., Sterner, T. & Wagner, G. A balance of bottom-up and top-down in linking climate policies. *Nature Climate Change* **4**, 1064-1067 (2014).

18. Dobson, A. in *Green Political Thought* (Routledge, London; New York, 2007).

19. Ostrom, E. Polycentric systems for coping with collective action and global environmental change. *Global Environ. Change* **20**, 550-557 (2010).

20. Townshend, T. *et al*. How national legislation can help to solve climate change. *Nature Climate Change* **3**, 430-432 (2013).

21. Roberts, N. C. Public entrepreneurship and innovation. *Review of Policy Research* **11**, 55-74 (1992).

22. Stavins, R. *et al*. in *Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* (ed Edenhofer, O. et al.) 1001-1082 (Cambridge University Press, Cambridge, UK; New York, USA, 2014).

23. Abbott, K. W. Strengthening the transnational regime complex for climate change. *Transnational Environmental Law* **3**, 57-88 (2014).

24. Bulkeley, H. *et al*. in *Transnational Climate Change Governance* (Cambridge University Press, New York, 2014).

25. Abbott, K. W. The transnational regime complex for climate change. *Environment & Planning C: Government & Policy* **30**, 571-590 (2011).

26. Hale, T. & Roger, C. Orchestration and transnational climate governance. *The Review of International Organizations* **9**, 59-82 (2013).

27. Bulkeley, H. A., Broto, V. C. & Edwards, G. A. in *An urban politics of climate change: Experimentation and the governing of socio-technical transitions* (Routledge, Abingdon, Oxon ; New York, NY, 2014).

28. http://www.unep.org/ccac/Media/PressReleases/Coalitionstepsupambitionforclimateaction/tabid/794355/Default.aspx.

29. http://www.ccacoalition.org/docs/pdf/CCAC\_Annual\_Report\_2013-2014.pdf.

30. Nachmany, M. *et al*. The GLOBE Climate Legislation Study: A Review of Climate Change Legislation in 66 Countries. *GLOBE International and the Grantham Research Institute, London School of Economics, London, UK* (2014).

31. Dubash, N. K., Hagemann, M., Höhne, N. & Upadhyaya, P. Developments in national climate change mitigation legislation and strategy. *Climate Policy* **13**, 649-664 (2013).

32. Massey, E., Biesbroek, R., Huitema, D. & Jordan, A. Climate policy innovation: the adoption and diffusion of adaptation policies across Europe. *Global Environ. Change* **29**, 434-443 (2014).

33. Harris, P. G. in *What's Wrong with Climate Politics and how to Fix it* (Polity Press, Cambridge, 2013).

34. Green, J. F. in *Rethinking private authority: agents and entrepreneurs in global environmental governance* (Princeton University Press, Princeton, 2013).

35. Paterson, M. in *Global warming and global politics* (Routledge, London, 1996).

36. Jordan, A., Huitema, D., Van Asselt, H., Rayner, T. & Berkhout, F. in *Climate change policy in the European Union: confronting the dilemmas of mitigation and adaptation?* (Cambridge University Press, Cambridge; New York, 2010).

37. Jordan, A., Van Asselt, H., Berkhout, F., Huitema, D. & Rayner, T. Climate change policy in the European Union: understanding the paradoxes of multi-level governing. *Global Environmental Politics* **12**, 43-66 (2012).

38. Harrison, K. & Sundstrom, L. M. in *Global commons, domestic decisions: The comparative politics of climate change* (MIT Press, Cambridge, Mass, 2010).

39. Schaffrin, A., Sewerin, S. & Seubert, S. The innovativeness of national policy portfolios–climate policy change in Austria, Germany, and the UK. *Environmental Politics* **23**, 860-883 (2014).

40. Jordan, A. & Huitema, D. Policy innovation in a changing climate: sources, patterns and effects. *Global Environ. Change* **29**, 387-394 (2014).

41. Jordan, A. & Huitema, D. Innovations in climate policy: conclusions and new directions. *Environmental Politics* **23**, 906-925 (2014).

42. Lachapelle, E. & Paterson, M. Drivers of national climate policy. *Climate Policy* **13**, 547-571 (2013).

43. Jordan, A., Wurzel, R. K. & Zito, A. The rise of ‘new’policy instruments in comparative perspective: has governance eclipsed government? *Political Studies* **53**, 477-496 (2005).

44. Ostrom, E. Coping with tragedies of the commons. *Annual review of political science* **2**, 493-535 (1999).

45. Ostrom, E. in *Governing the commons: The evolution of institutions for collective action* (Cambridge University Press, 1990).

46. Ostrom, V. in *Polycentricity and local public economies: readings from the Workshop in Political Theory and Policy Analysis* (ed McGinnis, M. D.) 52-74 (University of Michigan Press, Ann Arbor, 1999).

47. Widerberg, O. & Pattberg, P. International cooperative initiatives in global climate governance: raising the ambition level or delegitimizing the UNFCCC? *Global Policy* **6**, 45-56 (2014).

48. Cole, D. H. Advantages of a polycentric approach to climate change policy. *Nature Climate Change* **5**, 114-118 (2015).

49. Ostrom, E. A polycentric approach for coping with climate change. *Annals of Economics and Finance* **15**, 71-108 (2014).

50. Rayner, T. & Jordan, A. The European Union: the polycentric climate policy leader? *Wiley Interdisciplinary Reviews: Climate Change* **4**, 75-90 (2013).

51. Newell, P., Pattberg, P. & Schroeder, H. Multiactor governance and the environment. *Annual Review of Environment and Resources* **37**, 365 (2012).

52. Moncel, R. & Asselt, H. All hands on deck! Mobilizing climate change action beyond the UNFCCC. *Review of European Community & International Environmental Law* **21**, 163-176 (2012).

53. Matisoff, D. C. & Edwards, J. Kindred spirits or intergovernmental competition? The innovation and diffusion of energy policies in the American states (1990–2008). *Environmental Politics* **23**, 795-817 (2014).

54. Stadelmann, M. & Castro, P. Climate policy innovation in the south–domestic and international determinants of renewable energy policies in developing and emerging countries. *Global Environ. Change* **29**, 413-423 (2014).

55. Jacobs, D. Policy invention as evolutionary tinkering and codification: the emergence of feed-in tariffs for renewable electricity. *Environmental Politics* **23**, 755-773 (2014).

56. Huitema, D. & Meijerink, S. V. in *Water policy entrepreneurs: A research companion to water transitions around the globe* (Edward Elgar, Cheltenham; Northampton, MA, 2009).

57. Boasson, E. L. & Wettestad, J. Policy invention and entrepreneurship: bankrolling the burying of carbon in the EU. *Global Environ. Change* **29**, 404-412 (2014).

58. Weaver, R. K. in *Automatic government: The politics of indexation* (Brookings Institution, Washington, D.C., 1988).

59. Howlett, M. Why are policy innovations rare and so often negative? Blame avoidance and problem denial in climate change policy-making. *Global Environ. Change* **29**, 395-403 (2014).

60. Benson, D. & Jordan, A. What have we learned from policy transfer research? Dolowitz and Marsh revisited. *Political studies review* **9**, 366-378 (2011).

61. Mansbridge, J. The role of the state in governing the commons. *Environmental Science and Policy* **36**, 8-10 (2014).

62. Aligică, P. D. in *Institutional Diversity and Political Economy: the Ostroms and Beyond* (Oxford University Press, Oxford; New York, 2014).

63. Aldy, J. E. The crucial role of policy surveillance in international climate policy. *Clim. Change* **126**, 279-292 (2014).

64. Ford, J. D., Berrang-Ford, L., Lesnikowski, A., Barrera, M. & Heymann, S. J. How to track adaptation to climate change: a typology of approaches for national-level application. *Ecology and Society* **18**, 40 (2013).

65. Öko-Institut, Cambridge Economics, AMEC, Harmelink Consulting & TNO. Ex-post quantification of the effects and costs of policies and measures. **CLIMA.A.3/SER/2010/0005** (2012).

66. Mickwitz, P. in *Environmental policy in the EU: Actors, institutions and processes* (eds Jordan, A. & Adelle, C.) 267-286 (Routledge, London; New York, 2013).

67. Hildén, M., Jordan, A. & Rayner, T. Climate policy innovation: developing an evaluation perspective. *Environmental Politics* **23**, 884-905 (2014).

68. Martens, M. Voice or loyalty? The evolution of the European Environment Agency (EEA). *JCMS: Journal of Common Market Studies* **48**, 881-901 (2010).

69. AEA, ECOFYS, Fraunhofer & ICCS. Quantification of the effects on greenhouse gas emissions of policies and<br />measures: Final Report. **ENV.C.1/SER/2007/0019** (2009).

70. Bernauer, T. & Böhmelt, T. National climate policies in international comparison: the climate change cooperation index. *Environ. Sci. & Policy* **25**, 196-206 (2013).

71. http://www.wri.org/sites/default/files/pdf/critical\_decade\_for\_climate\_policy\_tools\_and\_initiatives\_to\_track\_our\_progress.pdf.

72. http://act2015.org/ACT%202015\_Improving%20Transparency%20and%20Accountability.pdf.

73. Aldy, J. E. & Pizer, W. A. Comparability of effort in international climate policy architecture. *HKS Working Paper No. RWP14-006* (2014).

74. Auld, G., Mallett, A., Burlica, B., Nolan-Poupart, F. & Slater, R. Evaluating the effects of policy innovations: lessons from a systematic review of policies promoting low-carbon technology. *Global Environ. Change* **29**, 444-458 (2014).

75. Somanathan, E. *et al*. in *Climate change 2014: mitigation of climate change. Contribution of working group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* (ed Edenhofer, O. et al.) 1141-1205 (Cambridge University Press, Cambridge, UK; New York, USA, 2014).

76. Thompson, T. M., Rausch, S., Saari, R. K. & Selin, N. E. A systems approach to evaluating the air quality co-benefits of US carbon policies. *Nature Clim. Change* **4**, 917-923 (2014).

77. Huitema, D. *et al*. The evaluation of climate policy: theory and emerging practice in Europe. *Policy Sci.* **44**, 179-198 (2011).

78. Hildén, M. Evaluation, assessment, and policy innovation: exploring the links in relation to emissions trading. *Environmental Politics* **23**, 839-859 (2014).

79. Harrison, N. *et al*. in *Enhancing Ambition through International Cooperation Initiatives* (Nordic Council of Ministers, Copenhagen, Denmark, 2014).

80. Beisheim, M. & Campe, S. Transnational public–private partnerships’ performance in water governance: institutional design matters. *Environment and Planning C: Government & Policy* **30**, 627 (2012).

81. Benson, D., Jordan, A., Cook, H. & Smith, L. Collaborative environmental governance: are watershed partnerships swimming or are they sinking? *Land Use Policy* **30**, 748-757 (2013).

82. Chan, M. in *Partnerships for Sustainable Development: Emergence, Adaptation and Impacts in Global and Domestic Governance Contexts* (Vrije Universiteit, PhD Thesis, Amsterdam, 2014).

83. Jenkins, J. A. & Patashnik, E. M. in *Living legislation: durability, change, and the politics of American lawmaking* (University of Chicago Press, Chicago, 2012).

84. Jordan, A., Bauer, M. W. & Green-Pedersen, C. Policy dismantling. *Journal of European Public Policy* **20**, 795-805 (2013).

85. Biesenbender, S. & Tosun, J. Domestic politics and the diffusion of international policy innovations: how does accommodation happen? *Global Environ. Change* **29**, 424-433 (2014).

86. Ostrom, E., Janssen, M. A. & Anderies, J. M. Going beyond panaceas. *Proc. Natl. Acad. Sci. U. S. A.* **104**, 15176-15178 (2007).

87. Ostrom, E. in *Understanding institutional diversity* (Princeton University Press, Princeton, NJ, 2005).

88. Fischer, F. in *Evaluating public policy* (Cengage Learning, Mason, 2006).

89. Bäckstrand, K. Accountability of networked climate governance: the rise of transnational climate partnerships. *Global Environmental Politics* **8**, 74-102 (2008).

90. Fankhauser, S., Gennaioli, C. & Collins, M. Do international factors influence the passage of climate change legislation? *Climate Policy*, advance online publication, 3 March 2015 (DOI 10.1080/14693062.2014.1000814).

91. Aligica, P. D. & Sabetti, F. in *Choice, rules and collective action: The Ostrom's on the study of institutions and governance* (eds Ostrom, E., Ostrom, V., Sabetti, F. & Aligica, P. D.) 1-19 (ECPR Press, London, 2014).

92. Hare, W., Stockwell, C., Flachsland, C. & Oberthür, S. The architecture of the global climate regime: a top-down perspective. *Climate Policy* **10**, 600-614 (2010).

93. Rhodes, R. A. W. The new governance: governing without government. *Political Studies* **44**, 652-667 (1996).

94. Roger, C., Halte, T. & Andonova, L. How do domestic politics condition participation in transnational climate governance? Paper presented at ISA, 56th Annual Convention, New Orleans, 18-21 February (2015).

95. Fuhr, H. & Lederer, M. Varieties of carbon governance in newly industrializing countries. *The Journal of Environment & Development* **18**, 327-345 (2009).

96. Sartori, G. Concept misformation in comparative politics. *The American Political Science Review* **64**, 1033-1053 (1970).

97. Lieberman, E. S. Nested analysis as a mixed-method strategy for comparative research. *American Political Science Review* **99**, 435-452 (2005).